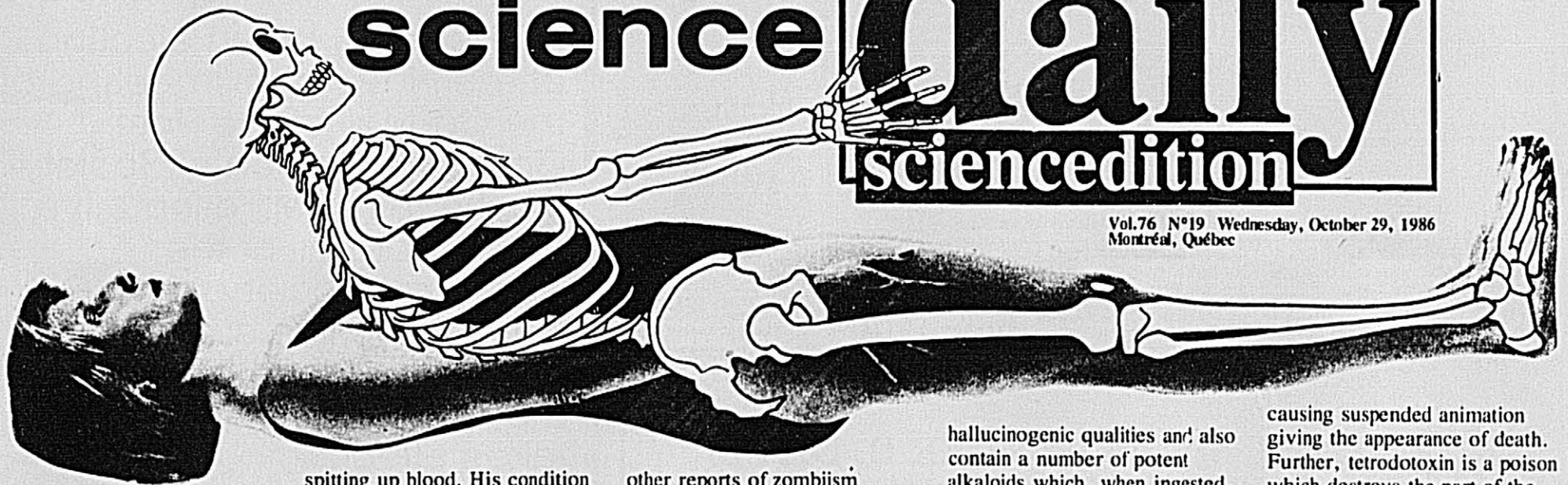


Dead certain: zombies and science

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By Susannah Prince

Are zombies just a part of our mythological lore, or are they really the living dead? In North America zombies conjure up images of blood-thirsty creatures, newly risen from the grave, who stumble around in a trance-like state. Their mission is to kill.

According to the Oxford English Dictionary, zombies are "a corpse revived and controlled by witchcraft or a spirit."

But in his recently published book, *The Serpent and the Rainbow* (Simon and Schuster, 1986), author Wade Davis claims not only that zombies exist, but that they can be scientifically explained.

Davis is not alone in this belief. His research in Haiti was partially funded by two well-respected psychiatrists, Dr. Nathan Kline and Dr. Heinz Lehman. Lehman was formerly the head of psychiatry and psychopharmacology at McGill and continues to practice there today.

Both Kline and Lehman were aware of the existence of zombies in Haiti. They both believe, however, that the zombie state is a drug-induced condition, and not simply superstitious nonsense. Their interest in zombies was sparked by the hope that the drug(s) involved might prove invaluable as a surgical anesthetic.

It was Kline and Lehman who sent Davis to Haiti in search of these drugs and it was with their help that he was introduced to Dr. Lamarque Douyon, a former McGill medical student, now the head of psychiatry at the Centre de Psychiatrie in the Haitian capital of Port au Prince.

It was Douyon who introduced Davis to Clarvius Narcisse — a man who had been declared dead on May 2, 1962.

When Narcisse had been admitted to the Albert Schweitzer Hospital in Deschappelles on April 30, 1962, he had a high fever and was

spitting up blood. His condition deteriorated rapidly, with digestive disorders, pulmonary edema, hypothermia, respiratory difficulties and hypotension ensuing. He was declared dead two days after being admitted to the hospital.

His 'death' was well documented and there were many witnesses including the immediate family of the 'deceased' as well as two attending physicians, one of whom was American.

In 1980 Narcisse walked up to his sister and introduced himself. It had been 18 years since he had last seen her.

Narcisse's story seems truly incredible. He claims to have been conscious at the time of his death and burial but was unable to show any signs of being alive.

Narcisse says that a few days after he was buried, a *bokor* (voodoo doctor), came with some assistants and raised him from the grave.

Narcisse was then sold into slavery and worked on a sugar plantation where he remained, until his master died two years later.

Narcisse wandered around for 16 years claiming that he had been too afraid to return to his hometown because it had been his own brother who had contracted his state of zombiism. It was only after his brother died that he dared to return.

Narcisse's case attracted Douyon's attention, who, wanting to test the validity of the story composed a detailed questionnaire which only Clarvius Narcisse could have answered.

After carefully checking hospital records and attendant physicians, Douyon was gradually persuaded that Narcisse's claim was valid. He got in touch with Heinz Lehman, whom he had studied under at McGill, and related Narcisse's case.

Lehman and Kline soon became equally convinced that there was some truth to Narcisse's story. There had been

other reports of zombiism although none had been as well documented. They believed that there was no such thing as the living dead as such but that there could conceivably be drugs which could cause a semblance of death. It was with this hope that they sent Davis, an ethnobotanist, to find out what drugs were being used to achieve the zombie effect.

Davis was successful in gaining admittance into a culture "where nothing was as it seemed." He managed to persuade one of the local *bokors* to make him some of the potion which consisted of the crushed skull of a young child, two lizards, and the carcass of a toad (wrapped around the toad's leg was a sea worm) and several species of plants and two types of marine fish.

Davis brought his findings back to the U.S. to test his findings. They would soon prove to be very interesting.

Davis findings consisted of the following: the two plants used in the zombie poison were *Datura Metel* and *Datura Stramonium* L., both of which have

hallucinogenic qualities and also contain a number of potent alkaloids which, when ingested, may result in amnesia.

The toad (*Bufo marinus* L.), was also found to have toxic qualities. Its toxin increased in potency when the toad was enraged — perhaps the reason

causing suspended animation giving the appearance of death. Further, tetrodotoxin is a poison which destroys the part of the brain that governs speech and will power.

A person who ingests this potion can continue to move and act although s/he can not formulate thought. Thus, this

He managed to persuade one of the local *bokors* to make him some of the potion which consisted of the crushed skull of a young child, two lizards, and the carcass of a toad (wrapped around the toad's leg was a sea worm) and several species of plants and two types of marine fish.

for the polychaete worm.

By far the most interesting of Davis' findings, however, was a toxin found in one of the marine fish, *Diodon hystrix*, more commonly known as the puffer fish. Tetrodotoxin, the poison found in the puffer fish, is a powerful neurotoxin which is one of the most poisonous non-protein substances known. It is 500 times stronger than cyanide.

Tetrodotoxin was found to be fully capable of lowering the body's metabolic rate and of

person effectively becomes a zombie.

Tetrodotoxin is now being carefully studied by western scientists. It is hoped that the drug may prove practical as a modern anesthetic.

Davis, although himself satisfied of the existence of zombies, had been unable to give any empirical evidence of their existence.

He has, however, discovered the scientific possibility of inducing a zombie state.

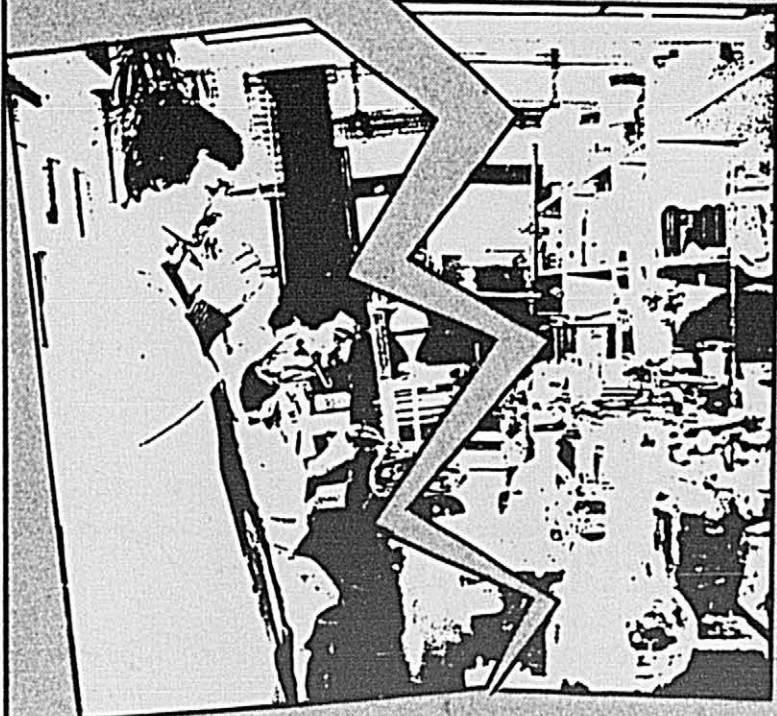
Canada snubs scientists

by Dan Hogan

Two of Canada's leading scientific researchers, Zbigniew and Sylvia Basinski, will soon lose their jobs at the National Research Council (NRC) as a result of the recent budget cuts.

News of their fate came after a flood of honours poured in from across Canada. Prime Minister Brian Mulroney sent a letter congratulating the Basinskis on being inducted into the Order of Canada this summer. Their highly respected work in metal physics has produced 30 years of scientific achievements.

Professor F.T. Hedgecock of McGill's Physics Department, once a post-doctoral fellow at NRC labs, was a colleague of Zbigniew Basinski in the Low



NRC labs: top research down the drain?

continued on page 3

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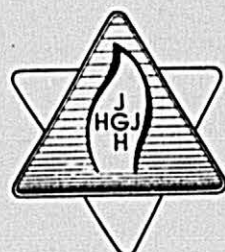
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NOTICE OF P.G.S.S. ELECTIONS

There will be an election at the November meeting of the Council of the Post-Graduate Students' Society for the third representative to the Council of the Students' Society of McGill University. The student elected will take office when the new SSMU Constitution takes effect.

The election will take place at 6:30 p.m. on Wednesday, November 5, at Thomson House. For more information call Daron Westman at 392-5959.

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From half life to shelf life

by Paul Stewart

Since its classification as a food additive by the U.S. government in 1958, the use of ionizing radiation to preserve food has appeared to the public as yet another instance of nuclear evil rearing its ugly head. Only in the last few years, however, have people become aware — let alone concerned — with this topic.

Metals, foods, the sun and the stars, even our own bodies radiate some half-dozen kinds of electromagnetic and particle radiation. A simple hot water radiator emits not only heat (infra-red) but also paricles and radiation from unstable atoms known as 'isotopes.' These are contained in the steel as well as the water inside the pipes.

When unstable isotopes are greatly concentrated, such as 60-Co (radioactive Cobalt), they form a source of radiation that is characteristic of the original element. The principal types of radiation from 60-Co are gamma and X-rays. These are the sources of energy used in food irradiation.

However, a distinction must be made between radiation and radioactivity. Radioactive isotopes emit radiation during their decomposition. Radioactivity always implies the *source* of radiation, whereas radiation is a short-lived phenomenon.

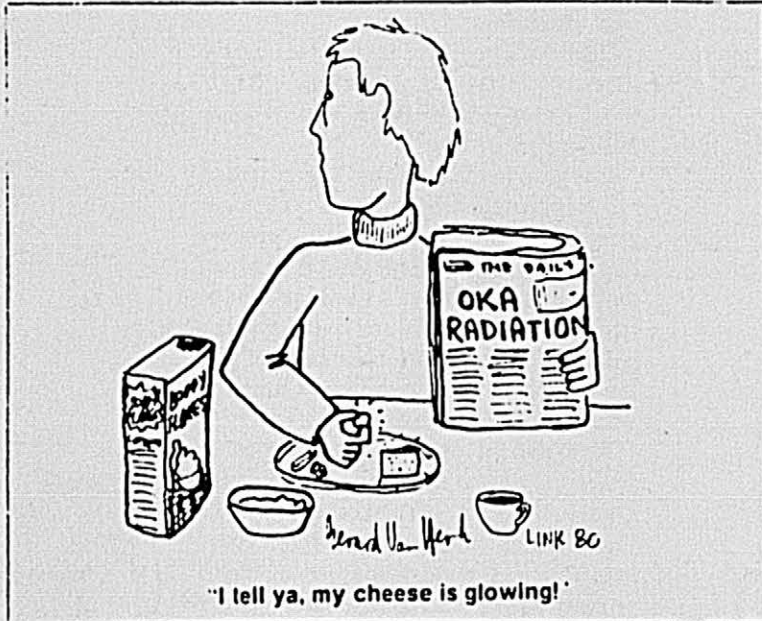
Two things can now be made very clear. The gamma rays and X-rays are used at doses that would be lethal to a human being, and are partially lethal to the bacteria and fungi that decompose meat and vegetables. But their action is transient, in that high-

energy rays pass through foodstuffs, leaving behind only the energy imparted to electrons of the food molecules. This is ionizing radiation, and when occurring in a living system, it can stop the delicate life-balances maintained by enzyme and gene function.

In non-living tissue, however, the action of radiation is more benign, imparting mostly heat,

is the principal criterion used internationally to legislate an upper limit of 10MeV in food irradiation.

To put the process in perspective, consider the amount of background radioactivity naturally occurring in food (isotopes such as 14-C, 3-H, 204 Pb). This is over a million times the amount of radioactivity that is imparted to



and a small amount of chemical change which lasts at most a few hours. The net result is food which, although itself essentially unchanged, will be decomposed much more slowly by severely impaired bacteria.

At the same time, one must keep in mind the vast difference between ionizing radiation of food and the amount of radioactivity in that food. Only massive doses of gamma rays, from 15 to 100 thousand volts (MeV), will cause the atomic reactions needed to form

a food sample during a 10MeV irradiation.

Last in the topic of radioactivity in food is the effect of gamma rays on those isotopes (13-C, 2-H, 17-O) more commonly found in food. These are actually converted into more stable forms, causing a net decrease in radioactivity. Thus, the US Food and Drug Administration concluded that, "in commercial practice, radiated foods contain less radioactivity than non-irradiated fresh foods."

With more informed consumers, and regulatory officials, the prime concern is not with radiation/radioactivity, but with the radiolytic production of free radicals — byproducts of the irradiation process. These are atoms of oxygen and hydrogen, excited by gamma rays, which are highly reactive with other molecules. Their action comes from destruction of chemical bonds, especially A, C, and the formation of rancid taste in fats.

Since the main sources of these radicals are water in food, and air, their formation can be limited by drying, freezing, or placing food in an oxygen-free enclosure prior to irradiation. In cases where this is unfeasible, lower doses of radiation can be coupled with conventional methods such as pasteurization or the use of preservatives.

Some special foods are very sensitive to irradiation, and require specific legislation. Dry foods form less free radicals, but with longer lifetimes. These foods (grain, flour, spices) are presently being irradiated in Canada, far below the international dose (75 vs 1000 Kilorads) recommended by the World Health Organisation (WHO). Even with higher doses, radicals last only a few days.

Since the purpose of irradiation is preservation in storage, there need only be legislation preventing *premature* use of this food. Fruit irradiated to slow ripening is softened in the process. This is a 'trade-off' issue that will find a balance between palatability and convenience in the marketplace, while remaining independent of legislation.

Such is also the case with dairy products, where longer shelf life — free of preservatives — must be achieved with no loss of vitamins, color change or rancid taste. In the case of such a high-turnover commodity, very little irradiation is needed to satisfy storage needs. If it is done at low, oxygen-free temperatures, it leaves the product indistinguishable from its fresh state in both taste and appearance.

However, real concerns must still be addressed by researchers and government. Doses acceptable to taste may not necessarily kill food bacteria. The more hardy survivors will continue to grow, unimpeded by their dead neighbors. If the survivors are toxin-producing bacteria, such as *Pseudomonas putrificans* in fish and the botulism bacteria, the net result will be an increase in the amount of toxin in stored meat.

One solution is to use higher doses, which may cause a rancid taste.

The other is to dose the food twice, with a time interval appropriate to the growth phase of the bacteria in question. The first dose would kill most bacteria and synchronise the survivors in their cell-growth cycle. During the fast-growth phase where their reproductive machinery is most sensitive, a lower, second dose would prevent further metabolism

and toxin production. Constant dose monitoring and product sampling would be necessary, but not greatly above that already done in the food industry for the use of nitrates, nitrites, and other unfavorable additives.

Finally, the subject of containment is perhaps the most important. Cobalt isotopes have a half-life of over five years. While this is short compared to the isotopes used in atomic and nuclear reactors, it creates a concern for food processors who will buy the substance, and workers who are in danger of exposure to lethal radiation. To date, legislation protecting workers and restricting disposal of 'spent' cobalt in Canada is sufficient, and similar to that governing researchers and hospitals.

Today, only wheat, flour, onions, spices, and potatoes are bulk-irradiated in Canada. Once wholesale use of the process is allowed, as in Holland and South Africa, there will be thousands of new users of radioactive material, few of whom have the experience shared by most present users.

Misuse could potentially increase the incidence of cancers in food employees. Historical review of similar labour issues shows that consumer protection often gets higher priority with legislators than the protection of workers.

The irradiation of food inevitably means greater profits for producers which, properly controlled, will result in consumer payoffs such as faster soup mixes, decreased chemical preservatives, lower-priced fruit and vegetables, and increased shelf-life for most perishable items.

The process is not another introduction of radioactive poisons in our lives. It is not the bomb, nor is it Chernobyl. But neither is it a panacea for spoiled food or a replacement for the refrigerator.

Keeping all that has been said in mind, it is the responsibility of the public — especially workers / unions — to make vocal, informed decisions about food irradiation before, like so many others, the decision is made for us.

...Canada snubs scientists

continued from page one

Temperature and Solid State section. Hedgecock says he is concerned with the state of science funding in Canada and with the government's apparently arbitrary behaviour regarding the NRC.

When asked his opinion of the recent NRC budget cuts, Zbigniew Basinski said, "Frankly, I don't see how the NRC can survive, especially since it was wounded badly two years ago." In 1984, the Conservative government announced that 400 research positions would be eliminated.

The news of the cutbacks did not come totally unexpected to Basinski since, as he stated two weeks ago, "...the popular belief seems to be that fundamental science is a waste of time."

What was surprising to him was that the cuts were made with such little protest. "If scientists don't protest, who else will?" he asked.

Equally surprising was the shift of NRC funds to the U.S. space station project. According to Basinski, the project is one of the most expensive ways to advance knowledge. Most of the research, he said, could actually be done on Earth at a fraction of the cost.

He pointed out that science funding in general is a small fraction

of the cost of technological development. He cited the "scientific tax credit fiasco" as an example of huge government waste.

Last week, Statistics Canada revealed that the bungled scheme, introduced by the Liberals in 1983, will cost the federal treasury almost \$3 billion in lost revenue by the time all claims are in. "With that kind of money, the government could have financed the entire NRC for six years," said Basinski.

The extent of cutbacks brings into question NRC's role as a leader in the scientific community, Basinski said. Ideally, there must be stability in research since many of the projects take years to complete. If these projects are frequently disrupted, years of research can go down the drain.

Research is further disrupted when highly qualified scientists are forced to abandon their projects, as the Basinskis have been forced to do.

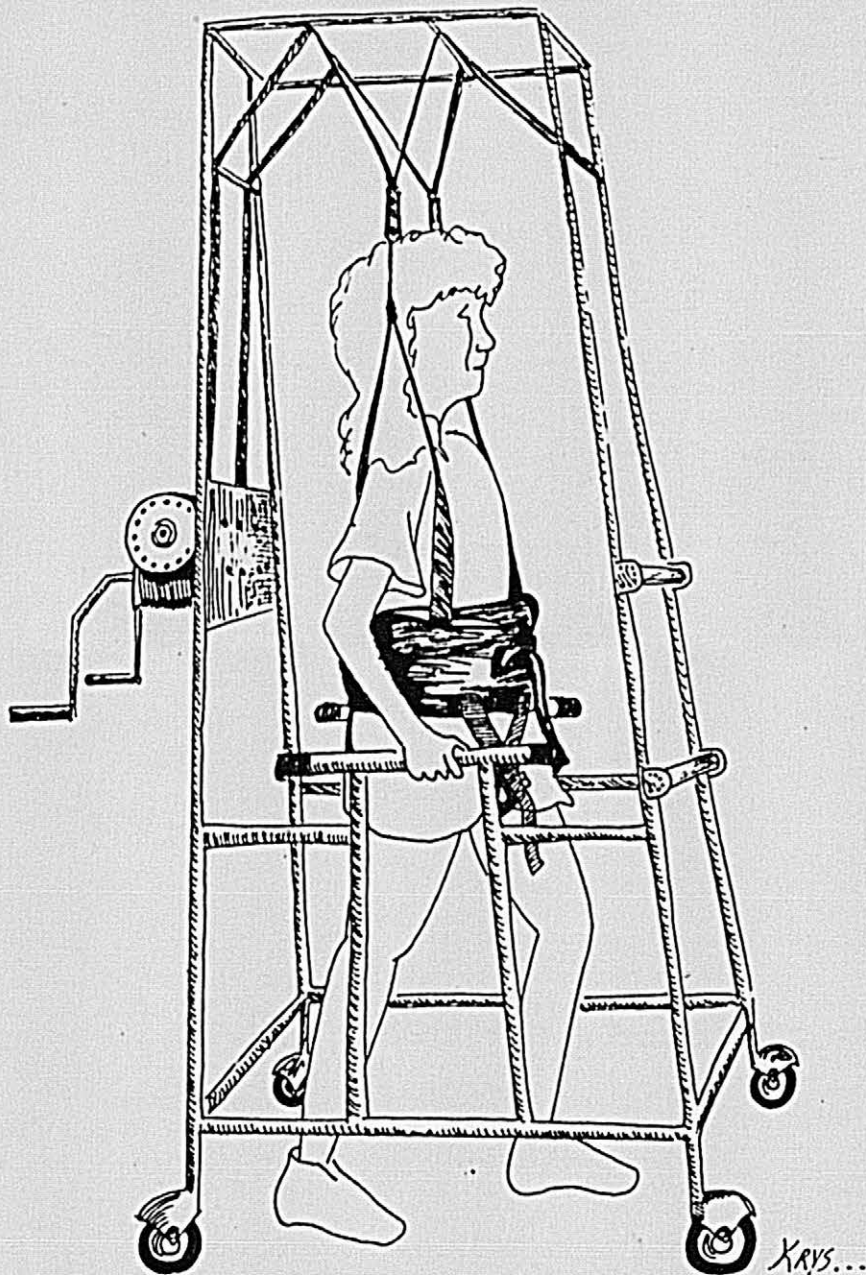
The NRC plans to absorb those displaced by the cuts through transfers, retraining and positions opened up by early retirement. When asked what he thought of these plans, Basinski responded with a question: "Can we expect original thought from scientists on an assembly line?"

But perhaps the most serious fallout from a financially crippled NRC is the discouraging atmosphere for young, aspiring scientists in this country. Canadian and foreign students will look south of the border for research careers.

Basinski suggested that the U.S. will be looking to Canada for scientists in order to compete with countries, such as Japan, which heavily fund research and development. He called hopes that the U.S. will share its knowledge with Canada "unrealistic." "Besides," he said, "who will there be left in Canada to share their knowledge with?"

Currently, Canada ranks somewhere between Iceland and Yugoslavia in terms of proportional spending on research and development. "What is there to stop us from becoming a Third World country?" he asked. Clearly, our future as a modern, technologically independent country is at stake.

Canada has been on the forefront of scientific discovery. The NRC has been recognized worldwide as a source of excellent scientific achievements. What Basinski and others fear is that Canada will lose its international stature as a research pioneer.



Walk towards rehabilitation

by Michael Finkelstein

As wheelchair athlete Rick Hansen rolls through Canada promoting spinal cord research, a team of five students working with McGill physiotherapy Professor Dr. Hughes Barbeau, have developed the key to a rehabilitation programme for people who have suffered spinal cord trauma.

It is a 'suspension walker' which enables patients to practice walking exercises while gently holding them upright and taking virtually all body weight off their legs — somewhat like an adult 'jolly jumper'.

The spinal cord carries messages from the brain to the rest of the body instructing it on how to perform the most simple of body functions. If the spinal cord is damaged, as in an accident, the message pathway may become interrupted and functions such as walking

become extremely difficult if not virtually impossible. The degree and location of the spinal cord damage determines the extent of a person's disfunction.

The victim of a spinal cord trauma is usually paralyzed in the lower body and/or ataxic, meaning that they have little muscular coordination. Attempts to rehabilitate a person in such a condition have been generally unsuccessful.

A treatment often used involves electrical stimulus. It is possible to electrically stimulate nerve endings in a manner which mimics the 'electrical code' sent by the brain.

The electrical stimulus is provided by electrodes attached to the body region where motion is desired. Directing an alternating charge through the electrodes results in involuntary muscular movements which simulate those of normal movement.

Though scientifically interesting, this treatment is of questionable use in rehabilitation. The electrical equipment required is costly, complex and cumbersome. Often drugs with adverse side effects need to be used with the electrical stimulus, and in the end the patient has not regained self-locomotive abilities.

If a person is left in a non-exercising environment, such as a wheelchair, their musculature and nervous system rapidly deteriorate from disuse. In a short amount of time irreparable damage results. With this in mind, Barbeau is studying a new rehabilitation programme.

Barbeau's subjects are predominantly recent victims of accidents. Their musculature and nervous system have not degenerated.

Exercise is the principal ingredient to the rehabilitation programme. Through exercise, the degenerative process might be circumvented. And it is hoped that exercise stimulus will aid in rejoining disrupted neuro-muscular pathways. It is therefore important that the exercise simulate the body function which is being 'retrained'.

A logistical problem then arose in finding a way to appropriately exercise a person who is paralyzed and ataxic. Conventional therapeutic mechanisms, available on the market, were unable to properly meet the requirements.

A large structure was built which held a harness, similar to that of a parachute, over a treadmill. This allowed a patient to 'walk' while only supporting a fraction of their own body weight. It was found that with time patients were gradually able to support a greater percentage of their body weight.

Barbeau had found results encouraging enough to call for the design and construction of a more accessible therapeutic device which functioned under the same principal.

Three McGill Mechanical engineering students were asked to design and construct such a device. Working closely with Barbeau and his graduate students, they designed their prototype and are presently finishing construction of the 'suspension walker'.

The suspension walker is essentially an aluminum frame on wheels. It provides the support needed to exercise a paralyzed/ataxic patient and allows the patient move freely. As opposed to the original treadmill arrangement, a patient will actually walk in this device and will more closely replicate the walking function which is being retrained.

The suspension walker is intended to remain at the Royal Victoria Hospital or at the Montréal General Hospital, where many patients will be able to benefit from rehabilitative exercise. Since the new walker will remain in the hospital, patients will not have to travel to the Physiotherapy department of McGill for their exercise sessions. This essentially means that more patients can exercise for more time and at a smaller expense.

The rehabilitative benefits that many patients will experience following Barbeau's programme remains to be seen. He is hoping, though, that the results will redirect the present treatment of spinal cord trauma, and will make a significant contribution to spinal cord research.

Torles squeeze NRC funds

On October 15, the National Research Council announced the following cutbacks in its budget:

- a \$20 million cut in jobs and programmes
- 200 jobs to be lost by next April
- research to be cut or curtailed in divisions such as biological sciences, chemistry, electrical and mechanical engineering, physics, and aeronautics

As part of the Tory's federal austerity measures, the cuts are designed to help reduce the national deficit.

The NRC will allocate \$16 million of funds realized from the cuts this

year and \$50 million over the next five years to the U.S. space station programme. The total cost of Canada's commitment to the \$12 billion orbiting platform project is forecast at \$800 million over the next 15 years.

In 1983, Brian Mulroney wrote in *Where I Stand*, "(The NRC) ... needs a funding increase of at least 20%."

Since 1984, the Conservative government has reduced NRC's staff from 3,600 to 3,000 and has slashed its annual budget from \$520 million to \$400 million.

by Paul A. White

If you drink milk, you may be happy to hear that Claude Ryan, Quebec's Minister of Higher Education and Science, recently announced an \$864,000 grant to researchers at McGill University's MacDonald College.

The grant supports a five year multi-disciplinary research effort by MacDonald College's Department of Animal Science in the field of Dairy Science. The team of scientists involved will include experts in such fields as biochemistry, biotechnology, nutrition, genetics and reproductive physiology. Their work will be coordinated by geneticist Dr. Kwai Hang Ng.

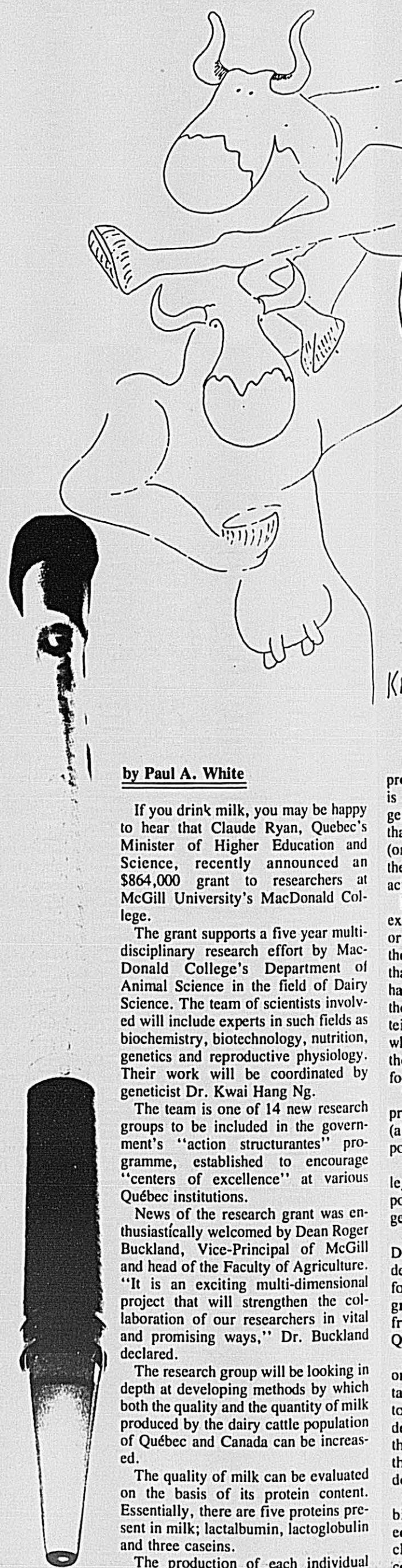
The team is one of 14 new research groups to be included in the government's "action structurantes" programme, established to encourage "centers of excellence" at various Québec institutions.

News of the research grant was enthusiastically welcomed by Dean Roger Buckland, Vice-Principal of McGill and head of the Faculty of Agriculture. "It is an exciting multi-dimensional project that will strengthen the collaboration of our researchers in vital and promising ways," Dr. Buckland declared.

The research group will be looking in depth at developing methods by which both the quality and the quantity of milk produced by the dairy cattle population of Québec and Canada can be increased.

The quality of milk can be evaluated on the basis of its protein content. Essentially, there are five proteins present in milk; lactalbumin, lactoglobulin and three caseins.

The production of each individual





Udder perfection at MacDonald College

protein (and thus its incidence in milk) governed by one locus or gene. A gene is essentially the segment of DNA that is involved in producing a protein (or polypeptide chain), and it includes the regions preceding and following the actual coding region.

However, at each locus the gene may exist in one of several alternate forms called alleles. Some of the genes coding for these proteins have only two alleles, but some have as many as five. Therefore, since the production of each of the five proteins is controlled by a single locus at which multiple alleles are present, the result is the existence of different forms of each protein.

When this is the case and a protein is present in a population in two or more allelic variants, it is said to be polymorphic.

The researchers at MacDonald College will be looking in great depth at the polymorphisms of milk proteins and the genes responsible for them.

Dr. Flan Hayes, a geneticist at MacDonald College, stated that it would be desirable to have certain polymorphic forms of milk proteins occurring at a greater frequency in the milk coming from the dairy cattle population of Québec.

"In the case of each milk protein, the polymorphic form has an advantage over the others, and we are trying to increase the frequency of the desirable polymorphic forms of each of these proteins through our controlling the allele that is present at the locus," declared Dr. Hayes.

From the standpoint of biotechnology, emphasis is being placed on improving the quality of milk for cheese production as well as for human consumption.

The polymorphisms of milk proteins are of great interest to the growing cheese industry of Québec. Research is currently being done to determine how variations in amounts or types of casein in proteins which are present in milk affect cheese yields.

During cheese production, the casein proteins coagulate into a solid curd, and the amount of curd obtained is dictated by the amount and types of casein present in the milk used. "The casein quality can make a big difference as far as the clotting mechanism to get curds out of milk is concerned," declared Dr. Elliot Block, a nutritionist in the MacDonald College research group.

Improving the quality of the proteins present in milk is also of interest from the standpoint of human consumption of the milk in liquid form. The nutritional value of the milk is actually higher when particular polymorphic forms of the proteins are present.

"So we are not just looking at improving the quality of milk from the standpoint of the milk that goes for processing into cheese; we are also looking from the standpoint of liquid milk consumption and human nutrition," declared Dr. Hayes.

Ultimately, the research group would like to isolate the genes responsible for the polymorphisms of milk proteins, clone these genes, and transfer them so that their incidence and expression can be controlled.

Investigations directly at the DNA level will include direct screening so as to determine what polymorphisms are present in the animal. "We want to be able to screen cows and bulls at the DNA level before the genes are expressed, and use the results as a selection tool," declared Dr. Urs Kuhnlein, a biochemist in the research group.

The identification of particular protein genes of interest may in turn have an effect on the methods by which animals are evaluated in terms of genetic value.

The current methods of evaluation are based on large-sample statistical ideas. However, if particular genes can be identified, this may cause some changes in the methodology presently used. Dr. Cue and Dr. Hayes, geneticists in the research group, are both concerned with the following question: if certain genes can be identified, what consequence does this have in terms of evaluating the population?

"Even if you could identify particular genes, there still exists all the other genes which have an effect on milk production which we can't yet identify. But we can still make use of statistical theory in making selections. Knowing about the particular genes we might have may change our methodology in some way to essentially allow us to use the fact that we now have more information about particular genes," declared Dr. Cue.

The screening of DNA directly to determine what polymorphisms are present can also allow for genetic selection and elimination at a very early stage in the animal's development. "Thus the generation interval that is involved is shortened, and the result is faster genetic progress. Otherwise we must wait until the cow first lactates at an age of two to two-and-a-half years," declared Dr. Hayes.

The research group will also be investigating the genes involved in the production of bovine growth hormone. Recent research using biotechnologically produced growth hormone has shown that circulating levels have an effect on the quantity of milk produced.

"When injected exogenously, growth hormone can increase milk production by as much as 20-40 per cent,"

declared Dr. Block.

Bovine growth hormone is a protein as opposed to other synthetic steroid hormones (such as diethylstilbestrol), which have been used to treat beef animals in the past. The difference is important due to the fact that steroid hormones — if present in milk — will not be degraded by digestive processes and can enter the bloodstream of a human consumer. Protein hormones however, will be completely degraded by the human digestive system.

Therefore, if growth hormone levels in milk — a normal constituent of milk in any case — rise outside the normal physiological range as a result of exogenous injection, this will not present a danger to the human consumer.

Thus dairy farmers can increase production without endangering the health of the consumer.

Far down the road, the MacDonald College research team hopes to perform gene transfers and introduce new genes into cow egg cells. In this way the actual genetic make-up of the organism can be varied so as to provide an increase in both the quantity and the quality of the milk produced.

For example, growth hormone is already produced by normal cows. Through genetic engineering it may be possible to increase circulating levels of the protein to increase milk production. This may be possible, "either through regulating expression of existing genes or by adding additional copies of the gene involved," declared Dr. Hayes. By building in the gene, through genetic engineering, the need for repeated injections of growth hormone can be avoided.

Ultimately these modifications of dairy cattle genetics envisioned by the research group will allow farmers to lower cost by reducing herd size and still keep production levels up. In the end this will benefit both the farmer and the consumer.

High tech hormone centre at McGill

by Susie Petersiel

Amongst computer-operated machines which break down liquids into individual parts, Director Samuel Solomon discusses with pride his six month-old Centre for Research on Endocrine Mechanisms (CREM) at McGill.

According to Dr. Solomon, Montréal has long been a major city for research into endocrinology — the study of hormones. It was here that Dr. Collip discovered the first method for extracting insulin, and also, Solomon notes, where Dr. C.P. Leblond, one of the "giants in the thyroid field — a real pioneer" is still a member of the McGill staff.

The CREM was started as the result of a grant from the FCAC, a fund for research grants from the Quebec government.

"Our original application for the grant was refused," said Dr. Solomon, "but we were urged to try again, and last year we got it. A centre for theoretical physics also received a grant. We also received money for instrumentation, which is very hard to come by. We're very grateful to the government."

"A centre such as this creates a critical mass of people who engage in both teaching and research activities," Solomon continued, "and money and prestige are then brought to the univer-

sity. With a higher research budget, the availability of scholars also increases, despite other budget cuts at the university. Anything that enhances scholarship is a good thing, and it's good to have researchers who teach as well."

The C.R.M.E. will deal mainly with the area of peptide hormones. Dr. Solomon feels the centre is also an important place to train people in their discipline. The opening of such a centre provides opportunities for all kinds of students, including undergraduates.

"There is a Dean's fund in the School of Medicine that provides money for medical students to do research work. It's the undergraduates that have a hard time, and we're hoping to be able to accommodate some of them," said Dr. Solomon.

Currently, there are also four Chinese students working at the centre on FCAC scholarships, and the centre has been advertised across Québec for interested graduate students.

As soon as the money came and the centre was approved by McGill's School of Medicine, the centre began operating. The centre was approved by the Senate over a month later, but merely as a formality.

Said Dr. Solomon, "I think it's terrific that the Québec government has given us the money. The deans of Medicine and of Graduate Studies supported us, and as a result, we've been successful."

StudSoc cares...

To the Daily:

Much controversy has arisen out of the Student Society's endorsement of a tuition fee increase. The opponents' claims are many and varied but I would like to deal with only some of the more tenuous arguments.

Firstly, SSMU has lost the confidence of its electorate say some opponents, since it chose to "ignore" the petition signed by more than 1500 students who opposed a fee increase. We hear that the our student representatives no longer represent us. In fact, nothing could be further from the truth.

It is the case that we are elected to represent the student body's interests but this should not be confused with their opinions. Students' views on every issue differ. For a counsellor to attempt to assess student opinion before making his or her decision is to mimic the neither practical nor moral style which presently flourishes in Ottawa.

Of course we would all like to have a good education for as little as possible. To argue otherwise is irrational. The salient point is that the quality of our education is suffering from a lack of funding. The fact of overcrowded classrooms and closed libraries can not just be shrugged off as unfortunate realities. They are impairing all of our abilities to get the most out of university. Thus the interests of the students are at the foundation of SSMU's decision.

Next, the claim that a rise in our tuition will cause mass drop-outs and exclude many from a university education, is not well thought out. We must remember that political decisions are not made in a vacuum. When the Bourassa government draws up their new proposal it will necessarily take into account the fact that student's are a large and often united voting group that must be appeased. To think that the grant and loan programme for universities would not become more comprehensive with a tuition increase is to believe that the government is willing to alienate this section of the electorate. As the SSMU / MAUT brief insists, we agree with a tuition increase only if accessibility does not suffer.

That the tuition increase has been passed only by those who are wealthy enough to pay it is false. If university is a priority in someone's life, this additional approximately \$1500 in 1990 will be well worth the pains to obtain it.

hyde park

The science policy of the federal government represents a threat to the future of science in Canada and should therefore be of real concern to science students. The chronic underfunding of university research and repeated budget reductions and programme cuts to the National Research Council (NRC) are indicative of a government which feels that the only justifiable science is that fundamental, non-specific research is the luxury of a poor climate for scientific pursuit in Canada and should be protested, especially by students seeking careers in science.

Basic research is not an extra that may be sacrificed in times of troubled economy; it is the root of the technology which is vital to the economy. Without

letters

The SSMU cares deeply about the plight of students and it is for this reason that we support a fee increase.

John Kaplan

Arts Representative to Council

Ed. note: Gavin Liversley — unless we know who you are (student? faculty? etc.) we can't print your letter. But if you give us a call, we'll be glad to.

Anti-divestment is pro-Apartheid

To the Daily:

I would like to briefly point out some of the many fallacies inherent in Libert's letter attacking Miller's comment from Oct. 16 and divestment. First, his point about social injustice in every country, not just South Africa, is an example of irrelevant reasoning. It follows from this line of argument that because social injustice exists everywhere, we should remain completely apathetic to pleas for help. Secondly, he ignores the tremendous difference in degree of severity between most of the problems in stable, prosperous nations and nations such as South Africa whose majority suffer not merely from social injustice, but from horrendous crimes against humanity.

The fact that many Blacks have died as a result of tribal rivalries with respect to those killed for political purposes is a faulty analogy. Death as a result of tribal warfare, old age, or drunk driving has nothing in common with the stifling of human rights by murder.

Thirdly, if Libert's glorification of the Botha régime and its humanitarian effort to right the wrong is valid, they why is the country still under martial law? Why is there censorship of everything? Why is Mandela still in prison? Why did they murder Samora Michel?

Finally, he wants to know how economic ruin can bring about a positive social change. The South African government currently devotes 50 per cent of its revenue for military purposes. If we can force them to divert some of their funds elsewhere, this may help the transition toward a free South Africa by organized effort happen much faster. Secondly, economic pressure will rouse the wealthy and the still ignorant out of their stupor. It is they who will be most affected — many of the blacks already live in abject poverty. Lastly, sanctions show the repressed that they are not forgotten nor alone in their struggle.

If Libert still rejects this solution,

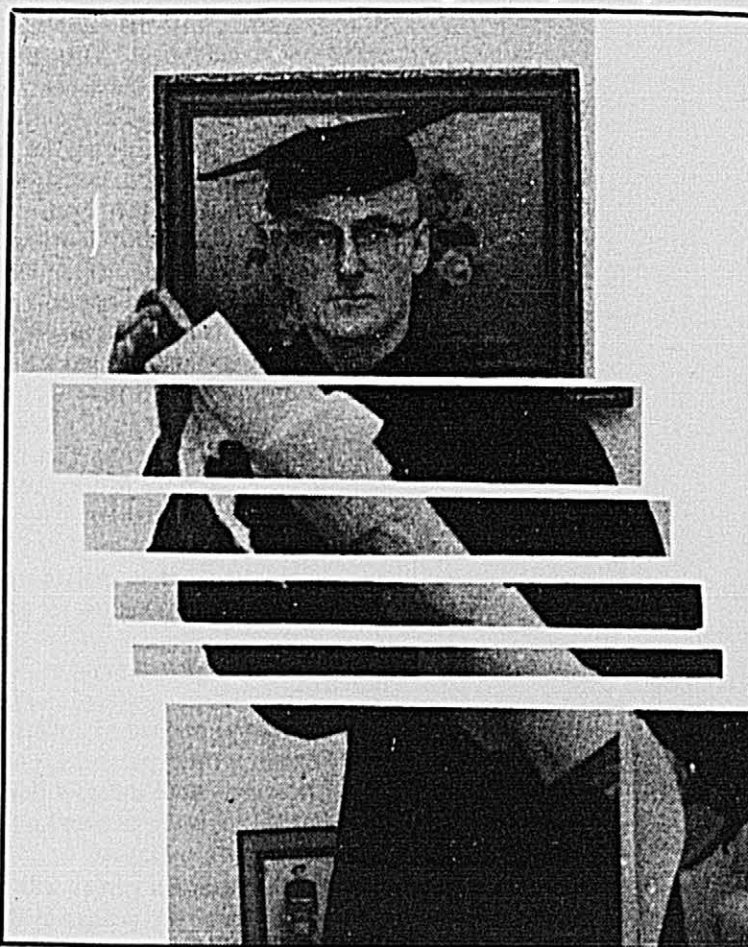
then I will gladly welcome a better proposal. However, dishing out more money to the South African government in terms of investment, sales, industry, etc. will certainly prolong Apartheid and the suffering of the people.

M. Chiu

Arts U2

Dead men don't whine

To the Daily:



(The squeaky wheel is back!) I'm disappointed Sue, but not surprised.

Slide remarks about "your" introduction being used twice (how was I to know that there was at least one other male on campus who recognizes today's "trendy" assertive feminism falls far short of the social / cultural reform it claims to be), or my "abuse" of the three hundred word limit (which I never knew about until after I submitted my first letter) fail to solve the issue.

Then you recant on your statement, "the very modes of relationship set up by this monopoly of power and privilege create violent and oppressive ways of pursuing the "good ends" envisioned by the male ruling class." If this is not an attempt to contribute the

creation of evil to men, then what is it?

And of course, all through your letter you "whine" about the historical injustices done to women. But you neglect the biggest pre-historic ripoff of all time. It happened the day that the male of our species was relegated to the "warrior-provider" role. Men have been screwed (stuck) ever since (most recently with the image of Rambo), unable to cast off this image for fear of losing their only "identity." Men who

ly) challenge the notion that men and women are equally mistreated by our Society. Because oppressor and victim can be quite readily identified in this situation — patriarchal society and the majority of women who are not part of it — one can make a judgement as to whom is suffering more.

Take the example of South Africa where white oppressors wield power over a black majority. Would Nathanson state here that the society is autonomous from the individuals that comprise it? Certainly there are whites who suffer "differently" and refuse to be part of the ruling hierarchy, just as there are blacks who give full support to the government in its actions. But in the final analysis, one can make a qualitative and quantitative assessment of the situation, just as one can for men and women.

Finally, the opportunity to do evil is not necessarily linked with the invention or the perpetuation of it. Hopefully we can recognize that a problem exists (which many have already begun to do) and take the steps necessary to reverse it.

Suzanne Mehmet

U3 Poli. Sci.

Parasite remarks unworthy

To the Daily:

I would like to thank the Montréal Gazette for letting me take the opportunity to respond to a statement I, and many of its readers, heard during the Thursday October 23rd broadcast of Hour Montreal on CJFM FM-96. CJFM's opinion time slot, headed by Peter Coleman, dealt with the demands of a great many students to have the tuition fees at Québec universities remain at their present level. Mr. Coleman's opinion was that while these kids were leeches on society and did not pay taxes they had no right to demand anything from anybody. Further he reiterated that they should go out get a job, pay some taxes and then we'll talk.

To begin with, I would like to point out that Mr. Coleman has taken a very simplistic and shortsighted view of what the real issue facing us is. One of quality education at a low cost. Secondly, he has also offended everybody presently enrolled in university or who 'has walked its halls' by diving to the depths of insult and abuse. Calling the young adults of today leeches on society shows Mr. Coleman's inability to deal with serious issues.

continued on page 8

think and feel (outside of poets and philosophers) are only now realizing the potential fulfillment in staying at home with the kids (househusbands) or working in non-traditional health care (i.e. nursing) jobs.

I've said more than I intended (again), but I find it extremely difficult to limit myself to neat three hundred word packages.

Greg Laws,
Grad. Studies

Wake up and smell the coffee

To the Daily:

Being the "intellectually absurd," "morally offensive," "extremely naive," "self-defeating feminist" I am, I must again (and hopefully conclusive-

basic research there can be no technological advancement. Since very few private sector laboratories in Canada have the resources of incentive to do basic research, they rely heavily on the publicly funded institutions like the NRC to provide the pure and applied research and scientific expertise on which to base their specific technology. Thus, the present cuts in research funding represent not only a loss of so many positions now, but also a potential for stagnation of science and technology in Canada which will mean fewer jobs later, both in government and in industry. The current attitudes are undercutting the foundations of science in this country and jeopardizing our future as scientists here. No student wishes to be forced to leave

the country in order to pursue his or her interests. And yet to stay — in a situation where scientists are demoralized by the constant threat of further cuts and frustrated because of the need to stay on top of the research fields which find political favour (and therefore funding), precluding any long term research programmes — is discouraging. The science policy will have this effect unless a stable environment can be established for the long-term effort which is fundamental research.

I urge fellow students and the various science students' societies to write to the Prime Minister and the Minister of State for Science and Technology, Frank Oberle, specifically to express concern over the current cuts in science funding

and, generally, to remind these gentlemen for the importance of basic research as a strong scientific base for our technology. A line or two would be sufficient — let them know our concerns.

The Prime Minister
The Right Honourable Brian Mulroney
Ottawa, Canada
K1A 0A2
(no postage necessary)

Science and Technology Canada,
Minister of State
The Honourable F. Oberle
House of Commons
Room 369 West Block
Ottawa, Canada
K1A 0A6

Carol Bowes
U3 Chemistry

the
mcgill
daily

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Ads may be placed through the Daily, Room B-03, Student Union Building, 9 a.m. to 3 p.m. Deadline is 2:00 p.m., two weekdays prior to publication. McGill students: \$2.50 per day; for 3 consecutive days, \$2.00 per day; more than 3 days \$1.75 per day. McGill faculty and staff: \$3.50 per day. All others: \$4.00 per day. **Exact change only, please.** The Daily assumes no financial responsibility for errors, or damage due to errors. Ad will re-appear free of charge upon request if information is incorrect due to our error. The Daily reserves the right not to print a classified ad.

341 — APTS., ROOMS, HOUSING

Need a roommate to share 2½ at Prince Arthur and Durocher. Renovated building, high ceilings, good view. New fridge, stove, table. \$238. Joshua 284-0787 10-11 pm best.

Shared accommodations — free rent in exchange for caring for man with Parkinson's disease for a few evening hours. 733-4847 after 10 a.m.

Two friends like another sharing 8½. Well furnished, special space, clean, easy-going, cats, \$400 total, 845-3829 evenings. Sherbrooke / Milton.

Bright, carpeted, quiet and clean bachelor for sublet. St. Marc. Fridge, stove, heat, laundry. Near Guy Métro and supermarket. \$355/mo. 932-6561.

Seeking 4th person to share interesting 6½ southwest of campus. Call 933-8976 after 10 p.m.

Spectious 5½, female roommate, Nov. 1st. Côte des Neiges, beside Mt. Royal. High ceilings, woodfloors, laundry, heat included \$325. McGill 20 min. 934-1763. Carolyn/Catherine.

1½ on St. Urbain/Pine. 12 minute walk from McGill. All utilities included. Available now, \$265.00/month, negotiable. Clean, large, quiet. Call 281-6665. Anytime.

343 — MOVERS

All local moves done quickly and carefully by student with large closed truck. Fully equipped, reasonable rates. Available Fridays, weekends only. Call Stéphane - 288-8005.

350 — JOBS

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Stockpersons and cashiers wanted at Van Home Bagel, 5263 Queen Mary corner Décarie. Part-time, minimum wage. Call 488-1078 (Kevin Hart).

352 — HELP WANTED

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Wanted: two students to help move a household up three floors in an elevator building. \$6 hour. \$24 minimum each. For Friday, Oct. 31. Call 337-4317 evenings.

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Willing males and females needed for student haircuts. Supervised by professionals. Wednesdays 6 p.m. — \$8. Call for appointments, 849-9231. Estilica 2175 Crescent.

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Experienced dentist requires a patient for Canadian accreditation exam. If you have some minor cavities. I would correct them **free of charge** during this exam on Dec. 18, 19, 20. Call 683-2759.

Cuba, Varadero New Years from \$599, Dec. 27 - Jan. 3. Afrolympic Travel. 274-3689.

Downtown esthetician is offering special student prices on facials, waxing and electrolysis for information call Mary: 845-4543.

Rap With The Rabbi: would you like to talk with a Rabbi? Contact Hillel's Chaplain, Rabbi Hausman 341-3580.

Anglican Chaplaincy - Student Eucharist every Monday 12 noon at the Newman Centre, 3484 Peel St. Bible studies, spiritual

direction. Call Fr. Dennis Drainville, 392-5890 or 879-1996.

361 — ARTICLES FOR SALE

Electric stove: good condition, \$110 (o.b.o.) Call 526-8752 evenings (Brendan) or 392-8959 between 12 and 7 p.m., Tues.-Fri. (Colin)

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Abonnements à la presse, prix spéciaux pour étudiants. De 9h00 à 17h00 au Daily, local B-03, Union Building.

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Down coats - long - white goose down. Men from \$175, women from \$130, jackets from \$99. Best buy in town. EXXA - 550 President Kennedy.

EXXA Club starting Sunday, Nov. 1, 1986. EXXA will be open to club members Sunday only - membership \$1 and with card you get 10% discount on Sunday only.

Programmable calculator - model T166. Hardly used. Save \$30. Asking for \$65. Burnside Hall 407 (messages 392-5700 for ED) after 22h00 (282-9040).

For sale: 10 speed bike \$80, dressers, chairs and plants 286-1311.

Must sell: One way plane ticket to Vancouver, leaves Dorval Nov. 10, 7:00 a.m. — \$220 (negotiable) Call Justin 937-3017.

URGENT! Toronto-Calgary 1 way ticket. \$175 (or best offer) - 524-5688 anytime.

Students! Dress on a budget! Gently used clothing for guys and girls. Affordable designer labels, jewellery, accessories. Le Bazar 1103 Laurier W. Outremont 277-9699, 2301 Herron Rd., Dorval 631-2104.

367 — CARS FOR SALE

1981 Granada 6 cylinders, 4-door,

70,000 km. One owner - \$2,700 (a steal), excellent condition. 281-3092.

370 — RIDES

I need a drive to Kingston, Ont., on Friday, October 31. Expenses shared. Call 281-0625 mornings or evenings.

372 — LOST & FOUND

LOST — Silver link bracelet. High sentimental value. Please call Karen at 487-4642. Reward.

LOST — Gold locket with design on front, inscription on back. Extreme sentimental value. Reward if found. Call 286-1634 or Molson 205.

374 — PERSONAL

Engineering bar nite is the place to meet friends. Next one is Halloween, Friday Oct. 31, 8:30. Deal for costumes. Don't miss it!

Ever wonder how other students feel, but never had the courage to ask? We're all students. McGill Nightline 392-8234. New hours 6 p.m. - 3 a.m. seven days a week!

We met on a Thanksgiving Sunday / Your girlfriend was away / Leacock introduced us / I hope it wasn't only lust / with no more boyfriend to see / I sure hope you would call me. Francois.

383 — LESSONS OFFERED

Private Tutorials: Finance, Accounting, Economics, etc... MBA/Bachelor programs. My place or your place. Money refunded if not satisfied first 15 min. Call 935-3729.

Flute and recorder lessons: cours de flûte traversière et de flûte à bec. For beginners or advanced. Call 388-5164.

French made easy... private or semi-private lessons. 281-9876.

Piano lessons: qualified teacher with B.Mus. for all ages. Call 235-9441.

385 — NOTICES

Two adorable pet rabbits for sale. Also, many baby rats to give away. Call anytime. 844-6002.

Biblical Discussion: "Shattering Illusions, Sharing Visions: The Bible and the Poor" Mondays in November 7:30 - 9:00 p.m., Newman Centre, 3484 Peel with Anglican and Presbyterian / United Church Campus Ministries. All welcome. Tel. 392-5890.

Craft fair: Nov. 21 4 - 9 p.m., Nov. 22 10 a.m. - 4 p.m., John Grant High School. 275 36th Ave. Lachine: 637-3545. Artisans call Ben 8 a.m. - 4 p.m. Proceeds to school.

Halloween Party: Come as you aren't. Friday, October 31, 9:00 p.m. 3484 Peel St (Newman Centre). No charge — BYOB. Costume prizes. Tel. 933-5201.

387 — VOLUNTEERS

Video artist needs woman for voice over for a historical v/tape. Prefer English speaker with native tongue other than French or English (seeking distinct accent). Contact Julian 284-0431.

Diabetic? If you are interested in important research into brain blood flow call Dr. Pokrupa at 284-5813. Financial remuneration available.

Volunteers: healthy controls needed for medical research into Diabetes Mellitus. Interesting project, involves taking blood, small financial remuneration. Call Dr. Fantus McGill, 392-4911.

Needed: Volunteers to tutor in group home in Snowdon. Grade 10 math, Grade 8 math and French. See Community McGill, Union Rm. 414, or call 392-8921.

389 — MUSICIANS WANTED

Bassist & keyboardist needed for rock/top 40 band. Must be equipped. Please call: Debbie 392-6723, Mike 392-8265, Richard 273-4460, Martin 272-3340.

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events

Today

McGill Student Pugwash: presents the first segment of David Suzuki's television series, *A Planet for the Taking* 19h00 at Lambda Chi Alpha, 3505 Peel. All Welcome free admission.

NDP/NPD McGill is holding its first general meeting. All interested are welcome to attend at 16h30 in the Union Building, Rm. 310. Any inquiries may be dropped off at our mailbox (StudSoc general office).

Women's Union Potluck Supper. Meeting at 18h30 followed by a discussion at 19h00 on Sexism in the Classroom. At 124 Boul. St Joseph E. For directions or information call 392-8920 or 849-4685. Toutes Bienvenues. All Welcome.

P.S.S.A. journal meeting at 15h00. Political Science Lounge on 4th floor.

Black Students' Network General meeting of B.S.M. All are welcome. Union 425, 16h45.

PGSS Bridge night. Grad students, members, and friends welcome at Thompson House. From 19h30 on.

letters

continued from page 6

Granted it is true that students' net income payable while in university is nil does not give him the right to slander them. For it is a generally accepted principal that the net benefits that are derived from the work of students, pre and post graduate, outweigh their present cost, either from a financial or societal point of view. To reaffirm this point, one only has to look at the advances made in technology and medicine that would be totally impossible without the help of the student research performed in order to complete their thesis studies. Financially, a graduate will no doubt receive a higher salary once in the work force. This, of course, means future increased income taxes payable which in turn discounts to a higher present value.

As a last point, I would like to stress that if Mr. Coleman's generation did not leave the generation of today with a debt of a few billion dollars, this whole issue of quality education at a low cost might not have to be considered. More likely, the youth of today are asking Mr. Coleman's generation to pay up on an outstanding debt already fully spent.

I hope that this letter has cleared up some serious misconceptions existing and I would like to point out that Mr. Coleman should do the appropriate thing by apologizing on the air to the youth of today, our hope for a better society tomorrow.

Jeffrey Shawn Henderson
U3 B Com.

Info: 845-9013.

Censorwatch Dame Peggy Ashcroft, Oscar award-winning actress, speaks "On Theatre and Film". Leacock 132 at 17h00. Free.

PSSA Diplomacy — A Game of Strategy — you study it now play it! 18h00 to 20h00, Leacock 429. Sign up in PolSci Office.

McGill Alpine Ski Team 16h30. Mandatory general meeting in Currie Gym, COTC Lounge. Dryland training at 17h00.

ing at 17h00

Uhuna Na Ufahamu Developing areas study group presentation on Western Sahara. Discussion of issues of silence week. All members please attend.

Hillel Students' Society Tickets will be on sale for the: wine and cheese party, comedy night and dance. 11h00 to 16h00. Union Bldg.

Students' Council regular council meeting at 19h00.

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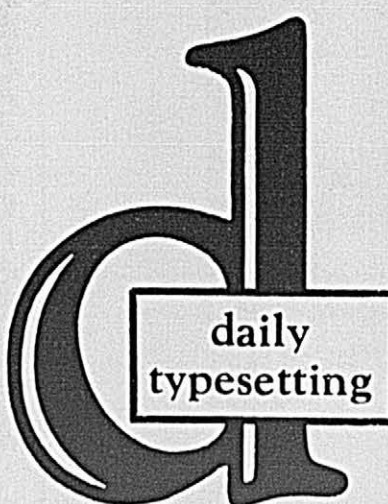
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McGill Outing Club. General meeting at 19h30 in Leacock 132.

Newman Centre Chaplaincy Catholic Workshop at 12h00 in William Henry Birks Building. Info: 392-6711.

Faculty of Music Regular rehearsal (19h30) and try-outs (18h45) for small group. Strathcona Music Bldg., Room C-304. Please bring all overdue fees by this week.

Central America Group Demonstrate for peace in El Salvador! Welcome the Caravan for Peace. At the U.S. Consulate (Place Desjardins), between 17h00 and 18h00.

Model United Nations Society of McGill First General Assembly meeting at 16h30 in the PSSA Lounge, fourth floor Leacock. All interested persons welcome.



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